Rocky Flats
Environmental Technology Site

PRO-477-RSP-16.03

Revision 1

Radiological Samples of Building Media

Responsible K-H Org Radiation Protection Effective Date 5/22/01

Approved By Manager / Radiation Protection / 4/6/01
Title / Title of Organization / Date

W G Zurliene / /s/
Print Name / Approval Signature

J W Mahaffey
Print Name of Responsible Manager (N/A if RM is Approval Authority)

THE RESPONSIBLE MANAGER HAS DETERMINED THAT THE FOLLOWING ORGANIZATIONS' REVIEW/CONCURRENCE IS REQUIRED REVIEW/CONCURRENCE DOCUMENTATION IS CONTAINED IN THE PROCEDURE HISTORY FILE

KH Analytical Services Division
KH D&D Advance Planning
KH Quality Assurance
KH Radiological Engineering
Material Stewardship and Offsite Shipment Project
Remediation Industrial Building D&D & Site Services Project
371/374 Closure Project
707 Closure Project
771 Closure Project
776/777 Closure Project
Engineering Environmental Safety & Quality Programs

IMPORTANT NOTES

ISR Review SISRC 01-13 **SES/USQD Review** SES-RFP-01 0790-MAW

Periodic Review Frequency 4 years from the effective date
This document supersedes PRO-477-RSP-16 03, Revision 0 and associated forms

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LIST OF EFFECTIVE PAGES

Pages	Effective Date	Pages	Effective Date
1 - 16	05/22/01		

Total number of pages 16

The following changes are active for this document.
None

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1 PURPOSE

This procedure provides requirements for sample collection of media samples to demonstrate that residual radioactive material present is below release criteria.

2. SCOPE

Media samples (e.g , paint, concrete, cinder block, and roof) for floors, walls, ceilings, roofs, fixed equipment, etc , may be required as part of a biased or random sampling plan for Reconnaissance Level Characterization or Final Status Survey

This procedure will address the documentation needed to initiate a sampling event, the necessary survey needed (i e., total and removable activity surveys), sampling labeling and sample transfer requirements, the sample analysis requirements, and sampling methods

This revision supersedes PRO-477-RSP-16 03, Revision 0 and associated forms.

3 RESPONSIBILITIES

3 1 Procedure User

Reads, understands, and complies with all requirements in this procedure.

3.2 Radiological Engineer (RE)

Defines the content and ensures preparation of Radiological Survey Plan and report.

Completes the Sampling & Analysis Request Form, refer to appendix in PRO-543-ASO-002, Initiation, Preparation, and Implementation of Chain-of-Custody Forms, for example

Obtains necessary historical and present-day information on the potential hazards of the area to be surveyed

Evaluates structures and appropriately classifies areas for survey as per MARSSIM.

Develops overall technical aspects, planning, and scheduling for the implementation of the Pre-Demolition Survey Plan (PDSP)

Develops the radiological survey instructions for individual survey units.

Resolves issues regarding survey layout and grid requirements.

Reviews surveys and sample analysis results for completeness, accuracy, and legibility

3 3 **Radiological Control Technician (RCT)**

Performs the pre and post total and removable activity survey(s) and survey of sample(s) taken by sampling personnel

Performs initial review and sign off of collected data

Provides complete, accurate and legible documentation

3 4 **RCT Technical Supervision (RCTTS)**

Responsible for the day-to-day supervision of RCTs

Reviews all survey forms for accuracy

Take the appropriate actions to mitigate the spread of contamination

3 5 **Sample Personnel**

Understand the instructions in the survey/sample package

Responsible for sample collection

Responsible for the radioactive material (RAM) hand-carry limits labels, and packaging in accordance with MAN-T91-STSM-001, Site Transportation Safety Manual (Appendix 4), and PRO-908-ASD-004, On-Site Transfer and Off-Site Shipment of Samples

Responsible for the proper completion of the Chain-of-Custody (COC) and associated labels, tags and seals

4 DEFINITIONS AND ACRONYMS

4 1 **Definition**

Background Radiation - Naturally occurring radiation in the human environment It includes cosmic rays, radiation from the naturally radioactive elements and man made radiation from global fallout

Chain-of-Custody - An unbroken trail of accountability that ensures the physical security of samples data, and records This documentation is necessary to ensure that all data produced from a sampling event accurately represent the collection site(s) Sampling protocols require that records be kept to show that the samples were controlled from sampling to disposal

Direct Measurement - Radioactivity measurement obtained by placing the detector at a specified distance from the surface or media being surveyed, in accordance with the specified instrument procedure An indication of the resulting radioactivity level is read out directly

Removable Activity - Surface activity that is readily removable by wiping the surface with moderate pressure and can be assessed with standard radiation detectors. It is usually expressed in units of dpm/100 cm^2

Rocky Flats-approved Sample Cooler - A sealed and locked sample cooler that is approved by the On-Site Transportation Committee

Sampling and Analysis Request Form - The Sampling and Analysis Request Form initiates a sampling event. When sampling is necessary, the requester contacts an Analytical Services Division (ASD) Customer Representative who forwards the Form to the requester After completion of the Form, the requester submits it to the Customer Representative who assures that the information contained in it is complete and accurate The Form is then transcribed and passed on to Sample personnel who in turn review it for an understanding, then contact the requester to schedule a date and time for the sampling event to occur

4.2 Acronyms

ASD	Analytical Services Division
COC	Chain-of-Custody
DCGL	Derived Concentration Guideline Level
dpm	Disintegration Per Minute
FSS	Final Site Survey
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
NORM	Naturally Occurring Radioactive Material
PDS	Pre Demolition Survey
RCT	Radiological Control Technician
RE	Radiological Engineer
RFETS	Rocky Flats Environmental Technology Site
RIN	Report Identification Number

5 LIMITATIONS AND PRECAUTIONS

- The Integrated Work Control Program (IWCP) shall be followed while implementing this procedure
- Prior to obtaining media samples, the sample location should be verified to be free of removable surface activity
- After each sample, wipe down the sampling tool to remove loose sample media and minimize sample cross contamination. The RCT shall survey tools between samples to verify they are free of radiological contamination.

- Sample containers for media samples shall comply with MAN-T91-STSM-001 and PRO-908-ASD-004 requirements If chemicals are used to strip paint or other surface materials the chemical resistance of the container should be considered
- Precise records of sample collection and handling are necessary to ensure that the data obtained from different locations or time frames are correctly compared
- Do not sample if there is a discrepancy between what is listed on the Sampling and Analysis Request Form and the actual listing on the sample container label
- Obtain Radiological Work Permit (RWP), if necessary, to perform sampling operations
- The method used to assay the radionuclides of concern should be recognized as a factor affecting analysis Ensure that assay methods are compatible with the media sampled

6 PREREQUISITES ACTIONS

Procedure User

[1] Ensure that the following are performed prior to sampling of building media

- The instrument being used meets the performance test and operational check requirements in accordance with MAN-102-SRCM, Rocky Flats Environmental Technology Site Radiological Control Manual Article 562 and as stated on the Instrument Technical Specification Sheets
- Survey personnel (RCT) are trained in the use of instrumentation and survey procedures prior to the collection of survey data
- Consult with Industrial Hygiene and with Radiological Operations to determine if any permits or notifications are required
- The survey package has been approved for implementation, including survey instructions regarding the location, number, and type of samples and survey required The area over which the sample is taken **SHALL** be recorded
- The appropriate sample containers, tools containment and materials are available
- Review the area/activity-specific job hazard analysis (JHA) to identify and obtain any tools, personnel protective equipment (PPE), or equipment require to control the anticipated hazards

7. INSTRUCTIONS

Sections 7 2 1 and 7 2.2 are stand-alone sections and may be performed independently or in conjunction with Sections 7 1 1 and 7 1.2, as appropriate.

7.1 General Requirements

7 1 1 Radiological Sample Requirements

RE or Requester

[1] Prior to collecting samples, a Sampling and Analysis Request Form (see Appendix 1 in PRO-543-ASD-002 for example) must be completed by requestor, then submitted to the Kaiser-Hill Company, L.L.C. (Kaiser-Hill) Analytical Services Division (ASD).

After review of the form, the ASD will provide the form to the Sample Personnel so the sampling process can begin

Sample Personnel

[2] At the location designated by the survey package, mark a suitable sized sample area as specified by the survey package

In order to perform a representative post-media sampling total surface activity survey, the size of the media sample should be at least as large as the applicable detector probe face

RCT

[3] Perform a pre-total and removable surface activity survey of the sample location in accordance with PRO-476-RSP-16.02, Pre-Demolition (Final Status) Radiological Surveys of Surfaces and Structures, to check for the presence of residual radioactivity

[4] Following sample collection, perform a post-total and removable surface contamination survey

NOTE *A survey may also be conducted whenever the RCT or the sampler deems it necessary*

[5] **IF** the surface contains removable activity in excess of the DOE Order 5400 5 limit of 20 dpm/100 cm^2,
THEN the surface should be decontaminated prior to media sampling and contamination results documented

NOTE 1 *Results of the post-media sampling survey will assist in determining if contamination exists under the media*

NOTE 2 *Post media sampling surveys should be taken as soon as possible after paint media samples are collected*

Sample Personnel

[6] Collect sample (see section 7 2 for Sampling Methods)

[7] Affix a sample label to each sample container

The label shall contain the following information

- Laboratory Destination
- Waste Stream Number
- Report Identification Number (RIN)
- Event Number
- Date
- Sample Personnel's Initials
- Remarks
- Laboratory Verification

All information shall be recorded using a permanent marker

[8] Perform sample transfer and sample labeling in accordance with the following

- Sample container labeling is in accordance with MAN-T91-STSM-001 (Appendix 4) and PRO-908-ASD-004 (Section 5 3)
- Sample transfer is in accordance with MAN-T91-STSM-001 (Appendix 4) and PRO-908-ASD-004 (Section 5 4, 6, 7 and 8) as applicable

[10] Wipe-down the sampling tool after each sample is taken to remove loose sample media and prevent sample cross-contamination

[11] Repeat steps [1] through [10] at each designated sample location

[12] Record sample numbers and complete the Chain-of-Custody (COC) form in accordance with PRO-543-ASD-002

RCT

[13] Complete the radiological survey forms for total and removable surveys in accordance with PRO-476-RSP-16 02, and the survey instructions in accordance with PRO-475-RSP-16 01, Radiological Surveys/Sampling Package Design, Preparation, Control, Implementation and Closure

Sample Personnel

[14] Attach a copy of the COC form and forward to RE

NOTE *Samples may not require Rad Screens if an exemption is granted based on previously collected samples (pertains to PDS)*

[15] Submit samples to a qualified laboratory for analysis or for a Rad Screen if the sample(s) are going to be sent to an off-site laboratory for analysis

7.1.2 Survey/Sample Package Documentation

Procedure User

[1] Maintain records of survey and sampling as part of a survey package

The survey package will be the primary method of controlling and tracking surveys and samples.

[2] Document total and removable surveys in accordance with PRO-476-RSP-16.02, Pre-Demolition (Final Status) Radiological Surveys of Surfaces and Structures; and survey instructions in PRO-475-RSP-16.01, Radiological Surveys/Sampling Package Design, Preparation, Control, Implementation and Closure.

[3] Document Chain-of-Custody form in accordance with PRO-543-ASD-002.

[4] Record on Surface Media Data Form (see Appendix 1) pertinent information needed to interpret the sample locations and surface area sampled and surveyed, as follows

- Sample Survey Area, Survey Unit if applicable, Building Number
- Sample Number, Location, Surface Area (cm^2)
- Any remarks that are pertinent to sampling operation.
- Name, signature and employee number of individual(s) performing the sampling

[5] Submit the completed survey package to RCT Technical Supervision for review

7 2 Sampling Methods

7 2 1 Media Samples

This section describes the minimum requirements for collecting media samples

Sample Personnel

NOTE 1 *Plastic bags may be located to maximize the amount of sample being taken while assuring that cross-contamination is minimized*

NOTE 2 *To avoid possible sources of cross contamination, be sure that the tape bonding material does not come in contact with the inside of the plastic bag*

[1] Tape a plastic bag around the area to be sampled

[2] Sample the area using the appropriate mechanical means necessary to collect the sample

[3] Record the surface area on Surface Media Data Form (see Appendix 1) for the sample

[4] **WHEN** sample collection proceeds,
THEN minimize media sample loss

NOTE *RIN numbers and minimum sample weights are provided by Analytical Services Division (ASD)*

[5] Collect the minimum amount of required sample, as determined by ASD

[6] Complete Surface Media Data Form (see Appendix 1)

[7] Complete the appropriate Chain-of-Custody form in accordance with PRO-543-ASD-002

[8] Record the sample number and a detailed description of the sample (refer to Section 7 1 2[4]) to complete the process

7 2 2 Roof Samples

NOTE *Roof samples are typically aggregate samples versus an actual core given the material type*

Sample Personnel

[1] Use sampling tools appropriate for type of material being sampled

[2] Collect a minimum 5 grams of material and assure that a minimal number of rocks is present in the material

[3] Record the surface area on Surface Media Data Form (see Appendix 1) for the sample

[4] Place the acquired sample in a sealable container, then seal the container, and place a pre-numbered label on the container

[5] Complete Surface Media Data Form (see Appendix 1).

[6] Complete the COC form in accordance with PRO-543-ASD-002, and verify that container is sealed.

[7] Thoroughly clean sampling tools

[8] Re-patch the sample area as required.

8 POST-PERFORMACE ACTIVITY

NOTE *Documentation generated as a result of this procedure is retained and dispositioned in accordance with Section 9 Records Processing Instructions*

RCT Technical Supervision

[1] Review survey package to ensure that the documentation is accurate and complete

[2] Upon review, note the following
- Not all lines or blanks will be pertinent for all surveys performed
- Each blank must have an entry in it so that an improper entry may not be entered later
- A section can be line out with a continuous single line by initialing and dating the line or by using the lettering "NA" or "N/A" to indicate "not applicable"

[3] Return unacceptable survey package to the RCT/Sampler performing/documenting the survey or sample form(s) for correction

[4] Ensure the RCT or Sampler promptly corrects errors and omissions and resubmits the survey results or sample documentation

[5] **WHEN** it is **NOT** possible for the originator to correct an error, **THEN** enter an explanation why originator could not make corrections, and initial and date the correction

[6] Forward the survey package to RE for data analysis and final disposition

9 RECORDS PROCESSING INSTRUCTIONS

The following documents are handled or initiated during performance of the activities described in this procedure

Record Identification	Record Type	Protection/Storage	Processing Instructions
Appendix 1, Surface Media Data Form, or equivalent; Chain-of-Custody (COC) and other supporting documents[1] related to survey and transfer of samples	QA Record (Non-WIPP)	Responsible Manager shall implement a reasonable level of protection for in-process QA records to prevent loss or degradation. Records shall be stored in standard office filing systems	Continued prescribed processing of documents. Upon completion of processing, approval and authentication records will be transmitted to appropriate Records Center (e.g Project Records) in accordance with I-V41-RM-001, Records Management Guidance for Records Sources. COC accompanies the samples from Site origin through final disposition at Lab and becomes a part of data package.
Sampling and Analysis Request form (SARF)	Worksheet Non-QA Record (Non-WIPP)	Refer to record matrix in PRO-543-ASD-002.	At ASD discretion, Form (worksheet) can either be destroyed as a non-QA record or placed in RIN file as a non-QA record
Completed Same forms as identified above, except SARF	QA Record (Non-WIPP)	Responsible Manager shall implement a reasonable level of protection for QA records to prevent loss or degradation in conjunction with Site Records Management organization to assure reasonable level of controls are being implemented.	When inactive, as defined in I-V41-RM-001, Records Management Guidance for Records Sources, transfer to Site Records Management for archiving in accordance with I-V41-RM-001.

[1] Supporting documents such as NMDTR, surveys, COC, and etc. are handled in accordance with establish procedures.

10 REFERENCES

The following documents are either directly referenced or used in the development of this procedure

DOE Order 5400 5 Radiation Protection of the Public and Environment

NUREG-1575 Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)

MAN-010-NMS, Site Nuclear Materials Safeguards Manual

MAN-071-IWCP, Integrated Work Control Program Manual

MAN-102-SRCM, Rocky Flats Environment Technology Site Radiological Control Manual

MAN-127-PDSP, Pre-Demolition Survey Plan (also referred to as Site PDSP)

MAN-T91-STSM-001, Site Transportation Safety Manual

No-Radioactivity-Added (NRA) Waste Verification Program

PRO-543-ASD-002, Initiation Preparation, and Implementation of Chain-of-Custody Forms

PRO-908-ASD-004, On-Site Transfer and Off-Site Shipment of Samples

PRO-475-RSP-16 01, Radiological Surveys/Sampling Package Design, Preparation, Control, Implementation and Closure

PRO-476-RSP-16 02, Pre-Demolition (Final Status) Radiological Surveys of Surfaces and Structures

PRO-480-RSP-16 06 Radiological Background Determination

PRO-1004-RSP-09 08 Radioactive Material Transfer and Unrestricted Release of Property Waste and Samples

Sampling For Waste Characterization For General Sampling Activities At Rocky Flats Environmental Technology Site Commodore Advanced Sciences (CAS) Standard Operating Procedure (SOP) - 003

1-V41-RM-001, Records Management Guidance for Records Sources

APPENDIX 1
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SURFACE MEDIA DATA FORM

Survey Area	Survey Unit	Building

SURFACE MEDIA DATA FORM

Lab Sample Number (RIN #)	Sample Location Number	Sample Surface Area (cm^2)	Sample Type (surface media, roof, etc.)

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